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COMPARATIVE STUDY OF SPINOZA AND NEO-REALISM AS INDICATED IN HOLT'S "CONCEPT OF CONSCIOUSNESS"

III

CONSCIOUSNESS

Holt's concept of consciousness: Cross-sections and their relation to the whole of which they are parts; consciousness a cross-section—Holt's psychophysical parallelism—Spinoza's concept of consciousness—Spinoza's radical empiricism.

Such a thing, then, as a tree for Spinoza is a non-mental, non-material substance brought to its present condition by an infinite series of interwoven causes, and it is definable in terms of these causes. For Holt, the tree is a complication of neutral logical entities, geometrical for the most part, acted upon by a series of logical propositions. It is perhaps definable in terms of geometrical planes, lines, physical laws of cohesion, etc. In fact, the full philosophic flavor of antiquity may be preserved and enriched with new meaning by implying that for Holt the tree is a plane-tree. But suppose I close my eyes and think of the tree—of what stuff is my thought-tree made? Where does the thought-tree come from, and why?

The intent of Holt's work is to give an answer to these questions in a logical account of the origin of consciousness.[23] "This means," writes Holt, "the framing of a set of terms and propositions from which a system is deducible that contains such an entity, or class of entities, as we familiarly know under the name of consciousness, or mind."[24] In such a presentation, it is not necessary to begin with the simplest terms of the realm of being, but merely with those entities one degree simpler than consciousness, as ranked in the neutral hierarchy. Such entities, it may be remembered, were the so-called physical objects, organic and inorganic. Of course, such entities are not understood to be "physical" in any sense contradistinguished from "mental" which would be a begging of the question in favor of "rank materialism." A purely neutral universe, made up of just such terms and propositions as our tree and endowed with those chemical complications of terms and laws known as organic life, must be kept in mind.

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[23] Holt, pages 166–184.

[24] *Ibid.*, page 166.

Although its relevancy is not immediately obvious, the first thing to be considered are the certain parts of these neutral entities which we call cross-sections.[25] The class of prime numbers in the numerical system, the portion of a mountain-side cut by a vertical plane of any or no thickness, the number of rainy days in every leap-year, are cross-sections of the inorganic world. The portion of a tree cut by a horizontal plane, the black hairs on a coach-dog, all wooden-legged people who ride in jitney-busses, or any of the romantic abstractions from human life to be found in statistical charts constitute cross-sections of the organic world. Such cross-sections of nature, humanity, or what not, although a part of the whole, make up a part defined by a law that is *not* the law which vitally defines the whole. That is, a series of highly complicated laws and terms, involving physical and chemical principles, make up the vital definition of a tree; whereas a simple geometrical proposition such as "Let a plane of no thickness pass vertically through the tree from topmost leaf to root" constitutes the law that creates the cross-section, a law that is entirely alien to the being or growth of the tree. Just so, the laws that create statistical charts out of the vastitude of human complexities and relationships are motivated by —I often wonder what these charts *are* motivated by! Now it will be noted that these cross-sections are usually of admittedly neutral stuff, stuff that all but chronic materialists and idealists would cheerfully concede to be neutral. The *shape* of clouds, the series of contours in a cross-section of no thickness passing through our tree are obviously neither "mental" nor "material." Before disclosing the meaning of this apparent digression, it must finally be observed that some cross-sections, the greater number of statistical charts, for example, are insignificant not only for the whole of which they are a part, but for anything at all.

Other cross-sections, however—and here we open the bag and look at the cat—are significant in and for a more complex and inclusive whole. Thus, man, in our survey of the neutral hierarchy, was ranked as more complex than fish, and included in his nature—along with a good deal more—all the entities and propositions that go into the making of fish. Now then, the number of trout to be found in a cross-section of a brook has significance and considerable significance for that inclusive complexity designated as an active member of a fishing-club. Similarly, a cross-section defined by the searchlight of a ship throughout a night is valued by the pilot. And, strange to say, in our present search for a proposition from which we can deduce consciousness from the neutral realm of ''physical'' objects, we find that the law which defines a certain cross-section in this ''physical'' realm has vital significance. The key is found in that cross-section which is defined by the nervous responses of any organism to its environment. Such responses are to be found in the most minute plant-life, and their total forms a neutral cross-section. The *turning* of a plant to the sun, the *intensity* of color which it develops, the *nodding* to the breeze constitute a cross-section from the total life of the plant which is avowedly neutral, and which is governed by laws not vital to the definition of the plant. If these responses are expressed mathematically, of which expression they are easily capable, their neutral character would more readily be revealed. And it is likewise apparent that it is usually the confessedly neutral qualities in the environment to which it responds. The plants, for instance, respond to intensities of light and velocities of air, etc. Moreover such a cross-section, defined by the responses, form for the organism its environment, the only environment which *for it* has existence. In the organism styled man, this cross-section, composed of neutral objects to which our nervous system responds, corresponds exactly with the list of objects of which we say we are ''conscious.'' Thus consciousness can be defined deductively from neutral substances: Certain complicated aggregates of neutral entities are ''physical'' bodies; still more complicated aggregates are defined by the nervous responses in these ''physical bodies''; this latter complicated ''manifold'' (cross-section) we call ''mental.'' The individual terms of this environmental cross-section styled ''mind'' we call sensations, perceptions, etc. ''In fine, the consciousness that depends on any given living organism is the sum total of all neutral entities to which that living organism [itself a complex of neutral entities] responds.''[26]

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[25] *Ibid.*, page 168.

By means of the foregoing account of consciousness, if I have restated it correctly, Holt believes that he has deduced the mental and the physical (as distinguished from the mental) from a given neutral without resorting to any pre-assumed ''mental'' or ''physical,'' and above all, without introducing his pet abhorrence—psycho-physical parallelism.[27] Holt justly berates the crude symbolism (the shield with two sides, etc.) and muddled mechanism

[26] *Ibid.*, page 184.

[27] *Ibid.*, page 309.

that passes for psychophysical parallelism; and yet, as I now propose to show, he himself has in no way escaped it. In attempting to bar this iniquitous intruder from a philosophy of consciousness, it is necessary to watch not only the main portals, but the cellar-door as well, and it appears that Holt has allowed the rascal to slip in unawares. Let us see if we can not detect his entrance.

According to Holt, I am a specific neutral entity, and the tree just without my window is another neutral entity. I look at the tree, and the looking amounts, on my part, to certain specific nervous responses to the tree. By so doing, I in no way affect the neutrality of the tree, and the tree in no way affects my neutrality; and yet these responses have converted the tree into a "psychic" thing and myself into a "conscious" thing. Nothing has modified us; we have not modified each other; and yet we have become different—call the difference one of relationship or what not. Let me put the operation into Holt's favorite logical terms:

Let (a, b, c, d) be a collection of neutral entities.

Let (m, n, o, p) be another collection of neutral entities.

Let (R) be the specific response of (m, n, o, p) to (a, b, c, d).

Then (a, b, c, d) becomes the body (Class B) of which (m, n, o, p) becomes the mind (Class M).

But the latter, class (M), is in no way modified or changed by standing in the relation (R) to class (B). Accordingly, the essential Spinozistic parallelism is reproduced, for the body and mind are not coincident and in no way modify each other as such.

It must be apparent that a mysterious property enters with the response (R) to modify (a, b, c, d) and (m, n, o, p), changing them into class (B) and class (M), respectively. But this is against Holt's postulate that all entities are neutral and remain such. Accordingly there is and can be no modification. And if there is no modification, and if the class (B) and class (M) nevertheless exist, and exist without affecting each other, psychophysical parallelism is the fact of the situation, regardless of the name given it.

To return to our specific illustration. If mind and body (with respect to myself and the tree) do not exist before I look at the tree; if my looking at the tree does not affect me as a neutral entity and does not affect the tree as a neutral entity; if, nevertheless, my looking makes a perceiving object of me and a perceived object of the tree, where, logically, can the class mind and class body come from? They can not come from the looking (the response), for by Holt's whole hypothesis, the looking (response) can not modify the neutrality of any neutral object. Clearly the classes mind and body, then, are begged; and they exist without logical reason as parallel classes into which the tree and I become at one and the same time members of two systems, body and mind. These systems have no influence on each other, yet bear to one another this ineffable and mysterious relationship—"specific response"—which makes one a content of consciousness and the other a seat of consciousness. By openly assuming these classes, without thereby denying the substantial unity of things, Holt would be a professed Spinozist. He seems, however, to have kept his eye so closely upon the response that he allowed mind and body to insinuate themselves, all unnoticed, into the entities responding and being-responded-to. I presume, therefore, it would be fairest to style him an unconscious Spinozist.

For Spinoza, as we have seen, frankly postulates at the beginning thought and extension as two attributes or aspects of a common substance. Accordingly, the nature and origin of the mind—a phrase with which he has named the second book of his "Ethics"—is deducible for Spinoza from this duplex nature of substance. This does not mean for Spinoza any more than for Holt that two distinct entities exist, one mental and one material, and that the first mirrors the second. All substance is one, and as such, is, with reference to "mental" or "material," strictly neutral. "Thinking substance and extended substance are one and the same thing, which is now comprehended through this and now through that attribute. Thus, also, a mode of extension and an idea of that mode are one and the same thing, but expressed in two manners. . . . A circle existing in nature and the idea of an existing circle . . . are one and the same thing."[28]

In the development of the Spinozistic theory, considerable emphasis must be expected, from the Spinozistic conception of true definition, to be placed upon causation. The extended order is subject to infinite series of causation and changes; and with every change of substance in the attribute of extension proceeds a change in the attribute of thought, for "the order and connection of ideas is the same as the order and connection of things."[29] Many parts, fluid, hard, and soft, compose the human body, and are constantly subject to changes and reactions from within and without.[30] A change in ideas accompanies each change in the body and environment, precisely as in Holt every nervous reaction must be accompanied by a change in the conscious manifold. Finally, the idea which constitutes the formal being of the mind is the idea of the body as a whole, that is, the mind is the sum of ideas accompanying the sum of the parts composing the human body.[31]

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[28] "Ethics," Pt. II., Prop. VII., note. A rational explanation of the conflict between this statement of Spinoza—which is in harmony with his conception of the universe as a whole—and the directly contradictory statement, quoted on pages 675–676, above, is that Spinoza when speaking of the difference between an idea and its extended object is speaking in terms of attributes not substance. Whenever anybody becomes specific, he can hardly avoid the same apparent contradiction.

[29] *Ibid.*, Pt. II., Prop. VII.

[30] *Ibid.*, Pt. II., Post. I.–VI.

What Spinoza says is that everything appears as mind or matter according to the relationship under which it is conceived. My idea of a room connected causally with my idea of entering a room is ''room'' under the attribute of thought; the thing ''room'' connected causally with the thing ''my body'' which entered it is ''room'' under the attribute of extension. However, the room and my body, and my idea of the room and body are one and the same in substance. This is no more or less than radical empiricism to which Holt, as we have shown, subscribes.[32]

A difference between the two philosophies might be pointed out here in the urging that for Spinoza all things in the ''physical'' world, including terms of which the human mind is not cognizant (such as the other side of the moon), exist as ideas in the mind of God; while, for Holt, such terms, since they do not exist in any conscious manifold, may be said to have no ''mental'' existence at all. Such a difference, however, has no bearing on the subject of human consciousness, for it is admittedly related to only such things as lie without human consciousness, and as such are barred *per se* as subjects of discourse.

IV

CONTENTS OF CONSCIOUSNESS

Mind the sum of ideas—Radical empiricism in treatment of secondary qualities; in the treatment of memory which in theory, though not in detail, is similarly explained by Holt and Spinoza—Volition, the mind in action—Personality, the sum of volitions—Table of similarities between Holt and Spinoza, as traced out in this essay.

In considering the content of consciousness, close resemblances and approximate identities characterize the treatment of sensations, perceptions, memories, and purposes; whereas sharp differences arise in the conceptions of values—truth, error, and beauty. The similarities result from the empirical treatment of consciousness, readily deducible from the foregoing discussion, and for the most part anticipated by the reader. Spinoza's ignorance of exact physiology makes a close intelligent comparison impossible, but the general philosophic position can be satisfactorily outlined. The mind, in the conception of both men, is no single entity, but is the total of ideas at any given time; nor are the ideas static entities capable of being separated from all external relations. They are resultants of a causal chain, themselves constantly productive of new effects, that is, new ideas, so that it can be said that ideas are the mind in the process of thinking.[33] Sensations and perceptions, for Spinoza, are results of "impacts" from the external world upon the brain, carrying with them the inevitable changes in the attribute of thought. For Holt, they are changes in the terms of the conscious manifold, resulting from external impacts upon the nervous organism and the latter's responses. Such terms are neutral and are identical in stuff and content when appearing in the conscious manifold and when appearing in the physical manifold. They are composed of just what they seem to be: the sensation of brightness is bright.[34] Similarly, for Spinoza, the idea of brightness *is* bright,[35] and the idea of a circle is circular (p. 705, above). With respect to any correspondence of mental content to "reality," Holt maintains there is none—sensations and perceptions *are* reality; and Spinoza would stand with him in declaring that the idea of brightness *is* bright in the attribute of thought, that the brightness itself *is* bright in the attribute of extension, and that the apparent dyad (which his philosophy has been credited with harboring) is in *substance* a monad—is *one*. Ideas are not copies of reality; they are reality in the world of thought, precisely as Holt would say that a perception is reality in the conscious manifold.

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[31] *Ibid.*, Pt. II., Props. VIII. and XV.

[32] The analogy between Spinoza and the radical empiricism of James is developed from suggestions in unpublished lectures of Dr. Kallen, of the University of Wisconsin, on Spinoza's and James's discussions of the relation between mind and matter.

Again, on the subject of Memory, to which are allied Imagination and Dreams, the physiology of Spinoza is antiquated, but the position is very similar to empiricism. He held that particles of the body impinge on other particles, and, through habitual series of impacts, create grooves.[36] Thus, a month ago I met Jones and borrowed ten dollars from him. The whole transaction as it occurred in the world of extension—seeing Jones, greeting Jones, wheedling Jones, and departing with the banknote—created a series of impacts within the body, particularly within the brain. Of course, a change in my thoughts paralleled every change in my body; and the ideas of seeing, greeting, wheedling, and departing followed in the same order as the physical events. To-day I accidentally turn a corner and see Jones again. The initial physical impact is similar to the initial impact of a month ago, and the particles of my body impinge one upon the other along the same groove worn by last month's series of impacts. As the impacts proceed to duplicate their former performance, a duplicate order proceeds in my thoughts. And so, upon seeing Jones, I remember that I greeted, wheedled, and departed with the ten dollars. Every memory, then, involves a condition of the body similar to that in which the event recalled by the memory took place. Accordingly, the exactness of the memory is in ratio to the exactness with which the bodily condition repeats itself.

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[33] "Ethics," Part II., Def. III.

[34] Holt, pages 212–213.

[35] "Ethics," Part II., Prop. XLIII., note. Spinoza does not express himself explicitly on the subject of secondary qualities, and his position must be deduced from his premises on Substance. However, in this reference, he speaks of how "light shows itself and darkness also."

[36] *Ibid.*, Part II., Prop. XIII., corollary and note.

Holt's conception of the memory is philosophically similar.[37] He describes the nervous organization as a highly complicated system of arcs. I meet Jones the first time. Specific nervous responses take place. This series of responses appears in my conscious manifold, and the transaction as an idea orders itself. I meet Jones the second time. The first specific response is similar to the first response of four weeks ago, and the succeeding responses travel along the arc already created. Whereupon, the transaction—save for its relation to events immediately before and after—appears identical in the conscious manifold to the previous one. It can appear no otherwise, for the responses are similar, and the responses define consciousness. And I say that I remember Jones. Again, as in Spinoza, the exactness of the memory depends upon the exactness with which the responses repeat themselves. But time and space enter into memory; are the time and space of memories *real?* Spinoza and Holt would say that they are as real as they appear to be. That is to say, the extension that Jones occupied when I first met him created, through my visual senses, certain impacts or responses. These responses appeared in my conscious manifold, or world of thought, as just so much space. If, a month later, the responses are accurately repeated, again there appears in my conscious manifold just so much space. Usually, of course, past time and distant space are imperfectly repeated in the nervous responses, and appear shortened or telescoped. In sum, the memory of a distant place, in so far as it includes an adequate idea of the intervening space, *is* that space, that quantity of extension existing in the attribute of thought.

Developing the definition (p. 707, note 33) of an idea as a conception of the mind "formed by the mind by reason of its being a thinking thing," Spinoza held action to be inevitable in the attribute of thought as well as in extension. The whole matter is deducible from Spinoza's description of *Natura Naturans,* the world in action, and his definition of things through their proximate causes. Consequently, ideas that are uncaused or that have no effects, inactive or impassive ideas, are inconceivable; and the will, or, more accurately, any volition is the action of the mind. If a volition is the mind in action, and the mind in action are its ideas, then the ideas desired must always be present with the volitions. And so Spinoza makes it an axiom: "The modes of thinking, such as love, desire, or any other name by which the modifications of the mind are designated, are not granted unless an idea in the same individual is granted of the thing loved, desired, etc."[38] Holt, in his interpretation of the world as logic, accords to volition the position and being of a "proposition," a generative law that defines a man's action, precisely as a formula describes a circle.[39] A "proposition" then is a "cause" dialectically defined. In the conscious manifold, a proposition acts, that is, causes, exactly as in the physical manifold. "My purpose is at once then the law of my movements; it generates them, and is in itself their sole unity."[40] Propositions are the mind in action, and such propositions can not by reason of their nature exist without terms. Such is Holt's way of stating the Spinozistic axiom I have just quoted.

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[37] Holt, pages 255 *et seq.*

It follows, then, that for Spinoza the total of the various modes —loving, hating, etc.,—of the mind's action plus the ideas loved, hated, etc., ("plus" is somewhat inaccurate, since the modes are not to be conceived with the ideas) constitute a personality, and that our conceptions of a central something *behind* our volitions is erroneous.[41] A sum of the terms and propositions in any conscious manifold define, for Holt, the personality of that manifold, whose degree of unity is in constant ratio to the predominance of any single group of propositions and their persistence.[42] The desire for self-preservation is the most potent of such unifying propositions, and forms the basis of Spinoza's ethical judgments. If the soul is a bundle of desires and their objects, freedom can not be granted as any behind-the-scene liberty, a property of a central will. In fact, Spinoza gives the only intelligent definition of freedom in defining a thing to be free which exists by the mere necessity of its nature and which is determined in its actions by itself alone.[43] Consequently, a mind, too, is free when its actions are determined by its own nature, that is, when it acts upon its own desires and is free to the extent in which this action is unhampered by external causes. Or, as Holt puts it, a mind is free to the extent that the propositions or laws governing its nature (terms) are unhampered by the action of laws governing terms outside the conscious manifold.[44]

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[38] "Ethics," Part II., Ax. III.

[39] Holt, page 284.

[40] *Ibid.*, page 287.

[41] See "Ethics," Part V., Preface, for a criticism of the Cartesian "soul" that haunts the pineal gland.

[42] Holt, page 301.

[43] "Ethics," Part I., Def. VII.

From this point, Spinoza develops his ethical position: analyzing the nature of the emotions; differentiating the mind as passive and as active; revealing the means of converting the passive mind—the mind submissive to its surroundings, at the back of external causes—into the active mind, whereby a man is master of his fate and enjoys that self-expression which Emerson would applaud. Such means amount to an understanding of the environment in terms of its essences and causes, an identification of oneself with *Natura Naturans*. However, it is just at this point that Holt ends his book—and our comparison.

Before considering the emphatic differences, a summary of similarities may be indicated by tabulating the terms and conceptions in Holt and Spinoza which are to a great degree similar, identical, or interchangeable—a summary which this essay has attempted to explicate in some detail:

Spinoza	*Holt*
Substance	Neutral Stuff
God	The Neutral Mosaic
Natura Naturans	Totality of Propositions
Natura Naturata	Totality of Terms and Relations
Attribute of Extension	Physical Manifold
Attribute of Thought	Mental or Conscious Manifold
Modes	Classes of Terms
Individual Things	Terms
Proximate Causes	Propositions
The necessary correspondence of the Attributes of Substance	Correspondence because of identity save for relation or position
"Adequate idea" through knowledge of cause	Definition by discovery of proposition
"Adequate idea" through knowledge of essence	Exhibition of undefined terms
Idea, as mind in process of acting	Volition as a proposition
Mind as active	Mind governed by propositions acting directly on terms within conscious manifold
Mind as passive	Mind governed by propositions acting on terms without the conscious manifold
Freedom, the acting according to necessity of one's own nature	Freedom, the unhampered acting of propositions within the conscious manifold

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[44] Holt, page 296.

IV

Error, Beauty, Change

Upon the subject of Error, Spinoza and Holt part ways; and their parting is the natural result of the positions they first assumed. Spinoza, in beginning with a unified Whole, runs upon the inconsistency inevitable to monists who are compelled to establish transcendent harmonies out of disharmonies. For Spinoza, an error or false idea ''consists of a privation of knowledge which is involved by inadequate or mutilated or confused ideas.''[45] That is, the totality of what Holt terms the nervous responses are not always present in the conscious manifold, particularly the self-conscious manifold, in the precise order in which they have taken place in the physical manifold. I have placed the explanation in Holt's terminology in order more clearly to show how impossible such a situation would be to Holt. The *sine qua non* of the latter is that since the nervous responses constitute consciousness, consciousness can not differ from the responses. Spinoza's position involves him in a further inconsistency. An inadequacy or confusion can not appear, by definition, in the mind of God (the thought attribute as a whole); and the mind of man, by definition, is comprised in the mind of God. Yet such inadequacies and confusions *do* appear in the mind of man. Holt's position, however, leaves him free from any such tangle. Error he maintains to be (as everything else) just what it is—a clash, a confusion. Not a clash and confusion between responses and consciousness, but between contradictory propositions in the neutral realm itself[46]—or, as Spinoza would term it, a clash of causes in the world of extension. These contradictions exhibit themselves for what they are in the conscious manifold—exhibit themselves, as Spinoza would say, as just such a class of causes in the attribute of thought. Holt's explanation, in a word, could be translated into Spinozistic phraseology, although Spinoza would hold the implied confusion in God to be impossible.

In the differing interpretation of esthetic values, however, the balance of reason seems to tip toward Spinoza. For all his absolute premises, he is an abiding relativist in his human judgments. ''Everything, in so far as it is in itself, endeavors to persist in its own being,''[47] the human mind no less than anything else. Consequently the mind tends to conserve and take pleasure in those things which it imagines conducive to its persistence of being, and suffers pain from the opposite things. Love, then, is pleasure accompanied by the idea of the thing that causes it; and hate is pain accompanied by its cause.[48] Accordingly, all esthetic judgments are relative to the person judging and express a relationship between him and the object judged. There is in Santayana's "Beauty is pleasure objectified" an echo of Spinoza. Holt, however, led on by the logic of his position that things appear as they are, finds tongues literally in trees, books in the running brooks, and painfulness in the Fighting Temeraire.[49] Such a view, though, is hardly compatible with his insistence that consciousness is dependent upon nervous responses, and that pleasure as a content of consciousness must also be dependent upon these responses, that is, upon the character of the organism that responds.

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[45] ''Ethics,'' Part II., Prop. XVII. and Cor. and Prop. XXXV.

[46] Holt, pages 278–279.

[47] ''Ethics,'' Part III., Prop. VI.

Finally, the conception of change in Holt may be termed shadowy to say the least. He is conscious of change in the world, is desirous of introducing it into his philosophic description of the world, and is absolutely in need of it to conserve the reality of his explanation of error as a factual contradiction of propositions. Apparently, however, he feels the inadequacy of logic to express this change. This is brought out markedly in his treatment of sensations. Admitting that sensations change, he attempts to account for it by splitting an apparently simple sensation into a group of sensation molecules, or psychic atoms, which, combining in various proportions, produce the desired change.[50] He feels the inadequacy of this, that it merely resolves the problem of change one step further back, from the sensation to the psychic atom; and although his explanation can not account for it, he declares, "there certainly is such a thing as logical change. There is change or activity in the neutral realm . . . but unfortunately, we know nothing about logical change. If logicians can ever be persuaded that universes of discourse are not necessarily static, we may some day know something about this."[51] This defect dogs Holt in his discussions of propositions and their activity, and has the tendency to make his logical description of the universe a painted ship upon the proverbial painted ocean. Spinoza, however closely he adheres to logic in his expositional methods, avoids any difficulty in the presentation of his universe as active that arises from identifying the logic of his exposition with the stuff of reality.

I have reached the limits allowed me in this paper; and, omitting the repetitions involved in a summary, I take occasion to say, in conclusion, that if the humanism of Spinoza and precision of Holt could be synthesized into a common philosophy, based on their common principles, the structure would in a notable degree be consistent, inclusive, and esthetically admirable. With respect to the common principles which Holt has apparently inherited from Spinoza, it may be considered either a reproach or a glory to philosophy that the theories of one generation are visited upon the third and fourth and that neo-realism is the setting of teeth upon edge.

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[48] *Ibid.*, Part III., Prop. XIII.

[49] Holt, page 110.

[50] *Ibid.*, page 219.

[51] *Ibid.*, page 219.

MARVIN MARX LOWENTHAL.

MADISON, WIS.

A COMMUNICATION IN REGARD TO "THE DISCOVERY OF TIME"

IN his interesting and subtle account of the discovery of time there are one or two subtleties of nature Professor Shotwell, it seems to me, has overlooked, and these oversights unsettle some of his conclusions, incidental conclusions let me add.

"No subtle distillation of animal instinct," he writes,[1] "can give us a 'sense' of that mysterious process in which the flow of a 'future' into a 'past' acquires a meaning. . . . The sense of Time is really a sense of times, and that is not a sense at all, but the slow product of developing intelligence."—When I fall asleep at one hour, bidding myself awake at another, and exactly at that hour I do awake—a time-keeping facility most of us possess in some degree—I do not feel I've been showing a developed intelligence, but in some way I do not understand I have been possessed of what would seem to me a sense of time. One who had been a patient watcher for several weeks at a certain water-hole in East Africa told me a while ago that daily "on the stroke of the clock" the different animal species came to that water-hole for their drink. A company of giraffes was an exception. They came regularly, too, but they came *every five days.* Now between these punctual animals and the human who wakes up at the time he sets himself I wonder if there is in their respective methods of time-keeping no similarity?

That there is similarity if not identity of behavior between the animals and the man who wakes up at the time he is in the habit of waking up, as we say, none will dispute. And it is really to the importance of habit as a time-keeper rather than to that mysterious facility for breaking a habit through time-keeping I would draw attention. Because Professor Shotwell has failed to attend to it he falls into that very common error of describing the savage as an

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[1] This JOURNAL, Vol. XII., pages 197 ff.